



July 2002

Volume 15, No. 4

## S525 Certified Cabs Shouldn't Be Used in Lieu of PPE

### 1 S525 Certified Cabs Shouldn't Be Used in Lieu of PPE

### 2 Pesticide Protection: Cabs on Sprayers and Tractors

### 3 Custom Hay Balers, Take Note

### 3 Systemic, Local Systemic, or Translaminar: What's the Difference?

### 4 Study Shows Turf Pesticides Break Down Rapidly

### 5 Pesticide Update

The American Society of Agricultural Engineers (ASAE) now recommends using agricultural cabs certified to meet ASAE standard S525-1.1 as a supplement to personal protective equipment (PPE), rather than as a replacement for it. S525 was initially created to certify specially equipped cabs intended to provide equivalent protection of some specific PPE listed on pesticide labels.

Two main features of S525-certified cabs are special cab filters for removing organic pesticide vapors, and positive-pressure ventilation. These cabs use filters with a tested and proven efficiency at removing pesticide vapors to provide a supply of filtered air to the climate-control system in the cab. In addition, the cabs are well sealed and maintain higher pressure inside the cab, so any air leakage would be of filtered air leaking out rather than of contaminated air leaking in. An in-cab pressure indicator is required so the operator can monitor the pressure and be assured that the filtration system is functioning properly. Low in-cab pressure could indicate excessive air leakage (as from a poorly sealed door) or a plugged air filter in need of replacement.

US-EPA personnel endorsed S525 in 1998, allowing operators of equipment with certified cabs to spray without some specific forms of PPE. The standard was developed with the expertise from many areas, including equipment manufacturers, regulatory agencies, and universities.

According to the ASAE, additional information has revealed more areas that need to be investigated and addressed besides what was initially considered during the development of the standard. Because of this, the ASAE recommends that S525-certified cabs not be used in lieu of PPE; rather they should be considered a supplement to PPE. All operators of sprayers equipped with such cabs should follow all pertinent PPE requirements stated on the pesticide label. (*Mark Mohr; sources: ASAE press release from 5/22/02; ASAE Standard S525-1.1.*)



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## Pesticide Protection: Cabs on Sprayers and Tractors

Many sprayer operators enjoy the comfort and appreciate the added protection of modern sprayers and tractors equipped with cabs. But how much of this perceived protection is real depends on the cab.

**Q: What difference does a cab make?**

A: One of the principles of risk reduction is **Hazard + Exposure = Risk**. For this discussion, we can say that the less exposure you have to a hazard (in this case, a pesticide), the lower the risk. The Worker Protection Standard (WPS) allows for cabs on sprayers that reduce operator exposure well enough that their protection is considered equivalent to specific types of personal protection equipment (PPE).

**Q: What can I *not* wear?** A: What PPE is needed depends on the cab and the pesticide being used. In brief, a cab may be used to replace some PPE up to the effectiveness of the cab's protection. Some PPE is always required, such as long pants, long-sleeved shirts, shoes, and socks. If additional protection is required on the label and beyond what your cab can provide (for example, air-filtration type and efficiency), the additional PPE must be worn.

**Q: Are all cabs equal?** A: Not all cabs are equal, so you must read the information from the cab manufacturer. The WPS requires that cabs be certified in writing from either the manufacturer or a government agency to provide certain levels of protection by filtering pesticides from the air or supplying clean air. If your cab isn't certified, you should wear the respiratory PPE stated on the label. Your cab must also be properly maintained according to the manufacturer's instructions and in good working order.

See the accompanying article on cabs certified through ASAE standard S525 for more information (page 1).

**Q: I bought carbon cab filters for my old cab. Does that replace PPE?** A: It takes more than a filter to exempt a sprayer operator from wearing PPE. Simply replacing the standard paper cab filter with a carbon filter does not fulfill the requirement. In fact, most places that sell replacement carbon filters prominently post that they are not replacements for other PPE. There are many other ways for pesticides to enter a cab other than through the air intake. Many cabs have holes for running wiring, shift linkage, and brake linkage. Door and window seals and many other cab features also provide routes for pesticides to enter the cab.

**Q: If I get out of the cab, will I need to have the PPE with me anyway?** A: When you spray with an enclosed cab, you need to have with you all relevant PPE listed on the label, even if you don't have to wear it in the cab. If you get out of the cab (to inspect, adjust, or repair something, for example) you need to wear the PPE. Keep the PPE in a pesticide-resistant container or bag. Wear it when out of the cab, but take it off before getting back in the cab so you don't contaminate the surfaces inside the cab.

**Q: You didn't answer my questions. Where can I learn more?** A: Below is the language from the WPS on PPE exceptions related to cabs. Read it, then get more information from

- your local UI Extension office, [www.extension.uiuc.edu](http://www.extension.uiuc.edu); or check your local phone book
- UI Extension Pesticide Safety Education, [www.pesticidesafety.uiuc.edu](http://www.pesticidesafety.uiuc.edu)
- US-EPA worker protection Web site, [www.epa.gov/oppead1/safety/workers/workers.htm](http://www.epa.gov/oppead1/safety/workers/workers.htm)

- US-EPA pesticides programs, [www.epa.gov/pesticides](http://www.epa.gov/pesticides); or phone (703)305-7666

The WPS is in the Code of Federal Regulations. Exceptions to PPE requirements pertaining to cabs are in 40 CFR, part 170.240 (d)(5). This is only the part on exceptions to PPE when using enclosed cabs and is from the Government Printing Office Web site, [www.gpo.gov](http://www.gpo.gov). Remember, this information must be used in context of the entire WPS.

“(5) Enclosed cabs. If handling tasks are performed from inside a cab that has a nonporous barrier which totally surrounds the occupants of the cab and prevents contact with pesticides outside of the cab, exceptions to personal protective equipment specified on the product labeling for that handling activity are permitted as provided in paragraphs (d)(5)(i) through (iv) of this section.

“(i) Persons occupying an enclosed cab may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If a respiratory protection device is specified on the pesticide product labeling for the handling activity, it must be worn.

“(ii) Persons occupying an enclosed cab that has a properly functioning ventilation system which is used and maintained in accordance with the manufacturer's written operating instructions and which is declared in writing by the manufacturer or by a governmental agency to provide respiratory protection equivalent to or greater than a dust/mist-filtering respirator may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If a respiratory protection device other than a dust/mist-filtering respirator is specified on the pesticide product labeling, it must be worn.

“(iii) Persons occupying an enclosed cab that has a properly functioning ventilation system which is used and maintained in accordance with the manufacturer’s written operating instructions and which is declared in writing by the manufacturer or by a governmental agency to provide respiratory protection equivalent to or greater than the vapor- or gas-removing respirator specified on pesticide product labeling may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If an air-supplying respirator or a self-contained breathing apparatus (SCBA) is specified on the pesticide product labeling, it must be worn.

“(iv) Persons occupying an enclosed cab shall have all labeling-specified personal protective equipment immediately available and stored in a chemical-resistant container, such as a plastic bag. They shall wear such personal protective equipment if it is necessary to exit the cab and contact pesticide-treated surfaces in the treated area. Once personal protective equipment is worn in the treated area, it must be removed before reentering the cab.” (Mark Mohr)

## Custom Hay Balers, Take Note

There has been some confusion regarding the classification of propionic acid used during hay baling. The confusion stems from the fact that formulations of propionic acid are sold for use in hay, yet they do not come with a recognizable pesticide label. As a result, the US-EPA has reiterated to the manufacturers that propionic acid is a pesticide and must be labeled as such when it is being used for pesticidal purposes. One such use is the application of the acid during hay baling because the product acts as a preservative by inhibiting rot organisms.

Propionic acid is *not* a restricted-use pesticide, so farmers applying it as a hay preservative for their own use do not need to be licensed. However, a custom/for-hire hay baler using the acid must be licensed as a commercial applicator in the field crops category. Commercial applicators must pay a \$45 annual license fee and provide a certificate of insurance.

Contact your local University of Illinois Extension office to obtain study materials to help you prepare for the general standards and field crops exams. You may make an appointment with the Illinois Department of Agriculture to take the examinations anytime during the year by calling (217)785-2427 for the Springfield office or (847)294-4343 for the Des Plaines office. Optional training sessions in conjunction with testing are provided during the winter, and your Extension office can provide you with further details. (Bruce Paulsrud)

## Systemic, Local Systemic, or Translaminar: What’s the Difference?

Many insecticides kill pests by contact activity. Insect or mite pests are either killed from direct contact during spray applications or by coming into contact with wet residues when moving around upon plant surfaces. Contact insecticides generally provide quick knockdown of target pests. Many insecticides from the older chemical classes—including the organophosphates (that is, chlorpyrifos and diazinon), carbamates (methiocarb), and pyrethroids (bifenthrin, cyfluthrin, fluvalinate, fenpropathrin, and permethrin) have contact activity. However, some insecticides that have either *systemic* or *translaminar* (local)

properties. In addition to insecticides, several fungicides are available with systemic activity, including mefenoxam (Subdue Maxx) and fosetyl-aluminum (Aliette). In fact, Aliette is the only fungicide available that moves both up and down the plant’s vascular system. However, this article primarily concentrates on the action and use of systemic insecticides.

Systemic insecticides are those in which the active ingredient is taken up, primarily by plant roots, and transported (translocated) to locations throughout the plant, such as growing points where it can affect plant-feeding pests. Systemics move within the vascular tissues, either through the xylem (water-conducting tissue) or the phloem (food-conducting tissue) depending on the characteristics of the material. However, most systemic insecticides move up the plant (water-conducting tissue) with the transpiration stream. Systemic insecticides are most effective on insects with piercing-sucking mouthparts, such as aphids, whiteflies, mealybugs, and soft scales, because these insects feed within the vascular plant tissues. Most of the newer systemic insecticides have minimal if any activity on spider mites because spider mites remove plant chlorophyll (green pigment) and don’t feed within the vascular tissues.

Systemic insecticides may be applied directly to the growing medium, soil; or they can be sprayed onto plant leaves. Systemics applied to the growing medium and taken up by plant roots may in some cases provide up to 12 weeks of residual activity. However, they may take longer to be distributed throughout the plant. In contrast, systemics applied to plant foliage may provide up to 2 to 4 weeks of residual activity. Nonetheless, foliar-applied systemics provide quicker kill of target pests. In either case, systemics provide the plant with long-term protection from pest injury.

The water solubility of systemic insecticides determines their movement within plants. Systemic insecticides, in general, are very water soluble (an exception is imidacloprid), which allows them to be taken up by plant roots or leaves. In addition, plants do not readily metabolize them. However, due to their high water solubility, they are subject to leaching and may potentially contaminate groundwater.

Older systemic insecticides/miticides that are no longer available include aldicarb (Temik) and oxamyl (Vydate). Currently available systemic insecticides include imidacloprid (Marathon, Merit), acephate (Pinpoint), and pymetrozine (Endeavor).

Systemic insecticides should be applied when plants have an extensive, well-established root system and when they are actively growing. This leads to greater uptake of the active ingredient through the vascular tissues. Applying systemic insecticides during warm, sunny days also leads to increased uptake of the active ingredient through the transpiration stream. In contrast, uptake is less when plants don't have well-established root systems. In addition, high-humidity and low-light conditions can lead to reduced uptake of systemic insecticides. Any delayed uptake of the active ingredient may result in the material's taking longer to kill insect pests. Systemics are also more effective when plants are herbaceous rather than woody, particularly on stem-feeding insects such as aphids.

Some insecticide/miticides have translaminar, or local, systemic activity. These materials penetrate leaf tissues and form a reservoir of active ingredient within the leaf. This provides residual activity against certain foliar-feeding insects and mites. Insecticides/miticides with translaminar properties include abamectin (Avid), pyriproxyfen (Distance), chlorfenapyr (Pylon), spinosad (Conserve), and acephate (Orthene). In

general, these types of materials are active against spider mites and/or leafminers. Because the active ingredient can move through plant tissues (that is, leaves), thorough spray coverage is less critical when using these materials to control spider mites, which normally feed on leaf undersides.

The benefits of using systemic insecticides include that (1) plants are continuously protected throughout most of the growing season without the need for repeat applications, (2) these insecticides are not susceptible to ultraviolet light degradation or "wash off" during watering, (3) there is less unsightly residue on foliage or flowers, and (4) harmful effects to workers and customers are minimal. A problem associated with systemic insecticides is that many have a single, or site-specific, mode of activity, which may lead to resistance. The selection pressure placed on pests from the continual use of systemic insecticides may result in the development of resistant genotypes. An exception to this situation is the insecticide Endeavor (pymetrozine), which has a broad, or physical mode, of activity. Endeavor kills aphids and whiteflies by blocking their stylet (feeding tube), thus preventing them from feeding. As a result, the insects starve.

Although systemic insecticides are generally considered less harmful to natural enemies, research has shown those specific predators such as *Orius* spp. that supplemental feed on plants may take up enough active ingredient to kill themselves.

Systemic insecticides can provide long-term control of insect pests without having to rely on regular spray applications. However, it is important to use proper insecticide stewardship to minimize the risk of insect populations' developing resistance to currently available systemic materials. (Raymond A. Cloyd)

## Study Shows Turf Pesticides Break Down Rapidly

According to a University of Illinois study, concerns about chemicals leaching into water supplies from the use of pesticides on grass are minimal because most chemicals break down quickly when applied to the foliage.

Bruce Branham, associate professor of turf at the University of Illinois, conducted a 3-year study showing that high levels of organic matter and microbial activity in turfgrass help pesticides degrade faster than when the products are applied to bare soil.

"Organic matter is a major controlling factor in how pesticides move, behave, and break down," he said. "With turf, you have this layer of insulation, you might say, over the soil; and, in many applications, hardly any of the pesticide actually gets into the soil."

Branham's research has focused on the dissipation of pesticides in turf settings versus production agriculture, where chemicals are applied directly to the soil.

Branham said the half-life of many pesticides is drastically reduced when the chemical is applied on a dense, well-maintained turf.

"Our best example was a pesticide that had a half-life greater than 60 days in bare soil. On turf, its half-life was about 3 days. So that makes for a safer system, but it still has to be managed well. No matter what kind of production system you have, if it's managed poorly, or if you overapply or use the wrong pesticides, you can still have leaching problems."

Although people are generally willing to accept pesticide use for crop production, many see turf as an ornamental use and do not understand why chemicals are used. When people see heavy pesticide use on golf courses, red flags are raised, Branham said.

Even on large golf courses or other highly maintained turf areas, though, the amount of acreage treated with chemicals is usually small compared to the size of the entire area, he explained. On a golf course of 150 acres, the most intensive maintenance is on the putting greens—about 3 acres, or 2 percent of the turf. Tees would consist of another 3 to 4 acres, and fairways would amount to 15 to 25 acres.

“We’ve found that turf, while not an ideal system, is pretty close. We have tried to show how turf can modify what happens when pesticides are used. Although it is best not to use chemicals, sometimes they are needed to handle a problem situation.”

Turf managers are encouraged not to use mobile pesticides if they have a choice. Very mobile pesticides have a propensity to leach regardless of whether turf is present. When more than one option is available, managers should use the one with the least potential for contaminating groundwater.

“Pesticides in the immobile category really aren’t going anywhere. They’re not a threat to groundwater or drinking water supplies. The moderately mobile compounds, which would be of concern in crops, are almost, without exception, immobile in turf. If a mobile pesticide is used, it is likely to leach whether it is applied to turf or soil.” (*Gary Beaumont*)

## Pesticide Update

*The following information provides registration status of particular pesticides and should not be considered as pesticide recommendations by University of Illinois Extension.*

### Agronomic

**BACILLUS PUMILUS GB34**—*Gustafson*—EPA issued an experimental permit to use this biofungicide as a seed treatment to treat soybean seed to plant

67 acres. It is used to control *Rhizoctonia* and *Fusarium* diseases and is authorized for use in IL as well as AZ, IN, IA, KS, LA, MD, MA, MN, MO, NE, OH, OK, TX, and WI. Expires 2-28-03. (*FR*, vol. 67, 4-10-02)

**OPTION** (*foramsulfuron*)—*Aventis*—EPA established an exemption from residue requirements on corn when Option is used as a herbicide. (*FR*, vol. 67, 3-29-02)

**PENNZOZEB** (*mancozeb*)—*Cerexagri*—Added to their label the control of wheat scab.

**REGENT** (*fipronil*)—*Aventis*—A new label reduces the use on corn to control wireworms and seed corn maggot. This is effective in IL as well as CO, IN, IA, KS, OH, SD, and WI.

**ROUNDUP** (*glyphosate*)—*Monsanto*—Proposed to EPA to amend residue tolerances on grass, forage, fodder, and hay at 300 ppm; aspirated grain fractions, 100 ppm; corn, field and forage, 6 ppm; wheat forage, 10 ppm; wheat hay, 10 ppm; animal feeds (nongrass), 400 ppm; rice grain, 15 ppm; rice bran, 30 ppm; rice hulls, 25 ppm; and wheat grain, 6 ppm. The comment period expired 5-17-02. (*FR*, vol. 67, 4-17-02) [herbicide]

**STEWART** (*indoxacarb*)—*DuPont*—Added to their label the use on alfalfa, peanuts, and soybeans. [insecticide]

**TRIBUTE** (*foramsulfuron/iodosulfuron*)—*Aventis*—Being developed as a postemergence combination herbicide for use on corn.

### Fruit/Vegetable

**AUXIGRO** (*GABA*)—*Emerald Bio Agriculture*—Added to the label of this growth regulator the use on onions to increase yields.

**AVAUNT** (*indoxacarb*)—*DuPont*—Added to their label the use on Brussels sprout, Chinese cabbage, Chinese mustard, cabbage, eggplant, potato, and kohlrabi. [insecticide]

**CLUTCH** (*clothianidin*)—*Tomen Agro*—Being developed to control aphids, leaf hoppers, apple maggots, leaf miners, leaf rollers, codling moth, and pear psylla on apples and pears.

**DIMETHOMORPH**—EPA authorized the use on squash, cantaloupes, watermelons, cucumbers, and pumpkins to control crown rot (*Phytophthora capsici*) from March 19 to September 30, 2002. (*FR*, vol. 67, 5-22-02).

**DUAL** (*metolachlor*)—*Syngenta*—The company has voluntarily canceled the registered uses on stone fruits and almonds, effective 3-22-02. Existing stocks should be used by 3-22-04. (*FR*, vol. 67, 3-22-02) [herbicide]

**ETHION**—*Cheminova/FMC*—EPA has issued a cancellation order for all registrations of this product. Technical registration will be canceled on 10-1-03 and end-use registration on 12-31-03. [insecticide]

**FLINT** (*trifloxystrobin*)—*Bayer*—Added to their label the control of blossom blight and powdery mildew on almonds and the control of botrytis bunch rot on grapes.

**MANEB 80WP** (*maneb*)—*Cerexagri*—Added to their label the control of anthracnose on almonds and lettuce.

**OMEGA** (*fluazinam*)—*Syngenta*—Received EPA registration to use on potatoes to control white mold and late blight.

**ONAGER 2E** (*hexythiazox*)—*Gowan*—A new formulation being developed for use on mint to control mites.

**PROMALIN** (*B.A.*)—*Valent BioSciences*—Proposed to EPA to exempt this growth regulator from residue-tolerance requirements on apples and pistachios. The comment period expired 4-29-02. (*FR*, vol. 67, 3-22-03)

**SECURE** (*etoxazole*)—*Valent*—A new miticide being developed for use on pome fruits, cotton, and strawberries. It is a molt inhibitor, so it controls eggs and juveniles but not adults.

*SPORAN* (rosemary oil)—*Eco Smart*—A new organic, broad-spectrum fungicide being developed for use on vegetable crops.

*SUCCESS* (spinosad)—*Dow Agro-Sciences*—Added to their label the use on root and tuber vegetables. [insecticide]

*TILT* (propiconazole)—*Syngenta*—EPA reestablished time-limited residue tolerances on blueberries at .1 ppm. They now expire 12-31-03. This measure is to extend a specific exemption to control mummy berry disease. (FR, vol. 67, 3-28-02) [fungicide]

## Turf/Ornamental

*BLADE* (metsulfuron)—*PBI Gordon*—A new formulation for use on warm-season turf to control bahiagrass, ryegrass, foxtails, and many broadleaf weeds.

*ENDORSE 2.5WP* (polyoxin D zinc salts)—*Cleary Chemical*—A new turf fungicide to control brown patch on cool-season grasses and large patch on zoysia. They are attempting to add to this label the control of yellow patch, gray leaf spot, leaf spot, melting out, pink snow mold, gray snow mold, red thread, damping off, and zoysia patch.

*FLONICAMID*—*ISK Bio Sciences/FMC*—EPA has registered this new systemic insecticide (which controls sucking insects) to use on ornamentals grown indoors in greenhouses.

*NEMACUR* (fenamiphos)—*Bayer*—The company has submitted a request to EPA to cancel all uses of this product over the next 3 to 5 years. The company plans to manufacture and distribute the product until the phaseout is complete. [insecticide]

*SIGNATURE* (fosetyl-Al)—*Aventis*—Added to their label the control of anthracnose and bentgrass dead spot on turf.

## Structural

*DIMETHOATE*—EPA has canceled the uses for this product in the following residential and public areas: in and around a structure used as a residence or domestic dwelling, including households, home gardens, and home greenhouses; in any public or private building or areas associated with them, such as landscaping and playgrounds; and also agricultural uses for housefly treatment in farm buildings and on farm animals and manure piles. (FR, vol. 67, 3-13-02) [insecticide]

*KAPUT* (warfarin)—*Scimetrix*—A new gel formulation used as a rodenticide for mole control. The gel simulates an earthworm, making it attractive to the feeding mole.

## Many

*ACETAMIPRID*—*Aventis*—This new neonicotinoid insecticide has been registered in the United States. It will be marketed as Assail for fruits and vegetables, Intruder for cotton, Tri-Star for ornamentals, and Pristine for the homeowner market.

*BROX 2EC* (bromoxynil)—*Albaugh*—A new formulation being introduced for use on corn, sorghum, cereals, alfalfa, flax, garlic, onions, mint, grasses grown for seed, nonresidential turf grasses, and noncrop areas. [herbicide]

*CAPTURE* (bifenthrin)—*FMC*—Added to their label the use on caneberries, field corn, and sweet corn, and the application by chemigation. [insecticide]

*COUMAPHOS*—EPA authorized the use in beehives to control varroa mites and small hive beetles from February 2, 2002, to February 1, 2003. (FR, vol. 57, 5-22-02)

*FLORAMITE* (bifenazate)—*Uniroyal/Compton*—Now available in a new SC formulation. [insecticide]

*GEM* (trifloxystrobin)—*Bayer*—Received EPA registration to use on potatoes and sugar beets to control early blight, powdery mildew, and leaf spot.

*GOAL 2XL* (oxyfluorfen)—*Dow AgroSciences*—Added to their label the removal of chemigation restrictions and added the use on garbanzo beans, garlic, and noncrop areas. [herbicide]

*HEXAHERB* (clove leaf oil)—*Eco Smart*—A new bioherbicide being developed as a postemergence material for fast burn down.

*LYSO PE* (LPE)—*Nutra Park Inc.*—EPA established an exemption from residue-tolerance requirements for this growth regulator on all food commodities. It is used to enhance ripening and improve the shelf life of fruits and vegetables. (FR, vol. 67, 4-11-02)

*METHOXYCHLOR*—*Kincaid*—EPA has proposed to revoke all existing residue tolerances for this product. The comment period expired 6-3-02. (FR, vol. 67, 4-4-02) [insecticide]

*MIDAS* (iodomethane)—*Arvesta Corp*—Registration for this new soil fumigant is expected in early 2003. It is being developed as a replacement for methyl bromide.

*MILAN* (pyraflufen-ethyl)—*Nihon Nohyaku*—This new herbicide recently received registration in Europe for use on cereals. It is being developed for use on corn, soybeans, cotton, potatoes, and sugarcane, and for noncrop uses.

*PLANT SHIELD* (Trichoderma harzianum rif AL strain KRL-AG2)—*Bio Works*—Added to their label for this biofungicide the use on flowers, bedding plants, ornamentals, berries, small fruits,

citrus, pome fruit, stone fruit, nuts, and hydroponic crops.

*PRISM (clethodim)*—*Valent*—Added to their label the use on canola, flax, mustard seed, leaf lettuce, broccoli, cabbage, and cauliflower. [herbicide]

*PROPIMAX EC (propiconazole)*—*Dow AgroSciences*—A new formulation recently introduced for use on cereals and other crops. [fungicide]

*SELECT (clethodim)*—*Valent*—Proposed to EPA to amend residue tolerances on alfalfa forage at 6 ppm; alfalfa hay, 10 ppm; dry beans, 2 ppm; peanut hay, 3 ppm; peanut meal, 5 ppm; peanuts, 3 ppm; tomato paste, 3 ppm; and tomato puree, 2 ppm. The comment period expired 5-17-02. (*FR*, vol. 67, 4-17-02) [herbicide]

*SPORODEX (Pseudozyma flocculosa)*—*Plant Products*—A new biofungicide being developed for use on greenhouse-grown roses and cucumbers to control powdery mildew.

*THIODAN (endosulfan)*—*FMC*—The company has sold the registration and marketing rights to Makhteshim-Agan. They did not buy the Thiodan name and will market the product as Thionex. [insecticide]

*TOPSIN-M (thiophanate-methyl)*—*Cerexagri*—Added to their label the control of acremonium seedling rot and charcoal rot.

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## Other

*BAYER*—The company plans to move its ag chemical division headquarters to Lyon, France, after its acquisition of Aventis is complete. The company will be renamed Bayer Crop Science.

*DOW AGROSCIENCES*—The company plans to close one of its research facilities located in San Diego, CA. This was the original facility built by Mycogen.

*KEMIRA AGRO*—This Finnish company has established a new name for its biological pesticide division. It will be known as Verdera.

*MAKHTESHIM-AGAN INC.*—The company plans to purchase the German agricultural chemical company Feinchemie Schwabba. This gives MAI access to the herbicides carbetamide, dimefuron, bifenox, and cyanazine.

*PYTECH CHEMICALS*—This is the joint venture between Dow AgroSciences and Cheminova to market synthetic pyrethroid insecticides. Their plant being built in Denmark should be in production this fall.

*SUMITOMO CHEMICAL*—The company has purchased a 50% share in the Italian company Isagro Italia from Isagro SPA.

(Michelle Wiesbrook, unless otherwise noted, adapted from Agricultural Chemical News, May and June 2002.)

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University of Illinois  
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